

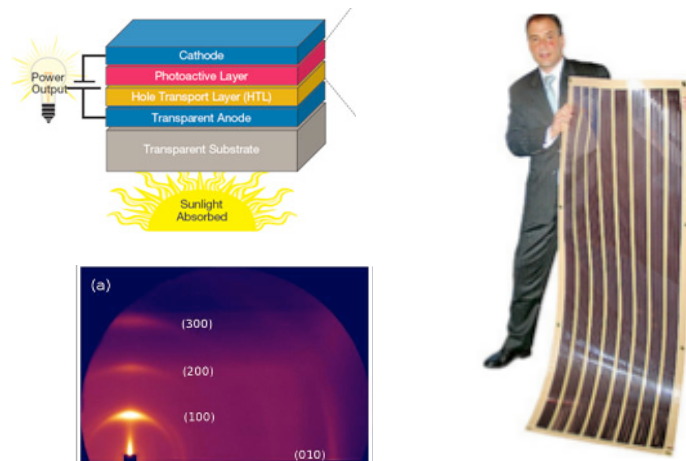
Soft Matter Interfaces Beamline (SMI)

SMI at NSLS-II

- Will enable in-situ studies of the structure of soft-matter interfaces using a variety of x-ray scattering methods
- Two dedicated endstations will allow studies to be carried out at the solid/vapor, solid/liquid, liquid/vapor, liquid/solid and liquid/liquid interfaces
- The high brightness of NSLS-II will allow both small and low divergent small x-ray beams and new opportunities for resonant studies in the tender x-ray regime

Examples of Science Areas & Impact

- ENERGY: To understand the microphase behavior and orientation of materials in thin film organic photovoltaic devices, a promising new class of energy materials
- ENERGY: To understand gas hydrate formation at the gas-water interface
- ENVIRONMENT: To improve our understanding of the extractant-mediated transfer of metal ions from an aqueous to an immiscible organic phase
- BIOMOLECULAR MATERIALS: To develop a fundamental understanding of self-assembly in order to create new materials with a range of architectural



(top) Organic photovoltaic (OPV) device configuration. (bottom) Diffraction pattern from OPV polymer materials. (right) Roll-to-roll prepared OPV sheet manufactured by Konarka with 4% efficiency. Research may lead to 10% efficiency in the next 5-10 years.

SMI Beamline Capabilities

TECHNIQUE(S): x-ray reflectivity, grazing incidence x-ray scattering/diffraction and anomalous/resonance techniques

SOURCE: in-vacuum undulator

ENERGY RANGE / RESOLUTION: 2.1-25 keV

SPOT SIZE: $\sim 2 - 5 \mu\text{m}^2$ using compound refractive lenses (ES1) and KB mirror (ES2)